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The Influence of the Great Recession on the Identification of Students From Non-White Populations in the State of Texas

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Abstract

The Great Recession is an economic crisis which has had repercussions through different facets of U.S. society. Texas, despite overall economic health, enacted severe cuts to the education as a result of the Great Recession. A potential consequence of these austerity measures is the identification of Black, Latinx, and Native American students for gifted education services. This paper examines effects of the Great Recession and educational budget policy on the identification of Black, Latinx, and Native American students for gifted services in Texas. Publicly available data was acquired from the Texas Education Agency on district demographic data from 1999 to 2015. A longitudinal mixed effect model was used to analyze rates of representation of Asian, Black, Latinx, and Native American students relative to White students. Results suggest that budgetary cuts to gifted education programs following the Great Recession did not adversely affect the representation of Black, Latinx, and Native American students in gifted education programs and that Asian students increased their representation in gifted programs.

Keywords: underrepresentation, Great Recession, Texas, gifted education, longitudinal

An economic crisis affects all facets of a society. The Great Recession, which began with the financial crisis of 2007, spiraled the United States into an economic crisis from which it is still recovering (Elsby, Shin, & Solon, 2016). Public education was one area where elected legislators believed that budgetary cuts could reduce the effect of the recession (Barr & Turner, 2013). Some of the results of the budgetary cuts were dismissal of teachers and other school administrative staff, an increase in student-to-teacher ratios, and degradation in the quality of general educational support for students (Freelon, Rogers, & Betrand, 2012). Special programs such as gifted education services are often the first downsized. Educational policies and choices directly contribute to the closing or widening of the educational excellence gap (Plucker, Burroughs, & Song, 2010). To be more specific, the most marginalized subgroups within the education system such as Black, Latinx, and Native American students suffered adverse changes during the Great Recession (Mordechay, 2017).

A decade later, educational budgets have not recovered to the level maintained prior to the Great Recession (Leachman & Mai, 2014). Regardless of where the cuts came from, the budget had to be balanced (Texas Education Code, 2 § 44.004). Given this, examining the reduction of educational budgets in response to the Great Recession is critical to understanding the factors that influence the excellence gap. To date, there is only one study that has examined the relationship between the Great Recession and identification (Card & Giuliano, 2016). In that study, the recession led a district to remove funding from gifted programs. This negatively influenced the identification of Black and Latinx students. In this paper, we examine how budgetary choices made at the district level influenced the identification of gifted underrepresented students in the state of Texas. This study seeks to reconcile whether similar reductions in gifted funding in Texas described by Hodges, Tay,

Desmet, Ozturk, and Pereira (2018) led to changes in the identification of non-White students in the state of Texas following the Great Recession.

Race, Inequality, and Gifted Education

The underrepresentation of Black, Latinx, and Native American students is a concern among education researchers (Ford, 2003; Ford et al., 2001; Hodges, Tay, Maeda, & Gentry, 2018; Plucker, Makel, Matthews, Peters, & Rambo-Hernandez, 2017; Yoon & Gentry, 2009). In addition, the enrollment of U.S public school students is becoming more diverse and will continue to diversify into the next decade (Herr, Castro, & Canty, 2012). The issue and need for research on the educational excellence gaps among ethnic groups has been stressed by researchers (Plucker et al., 2010; VanTassel-Baska, Johnson, & Avery, 2002), but discrimination and bias still exist in education (Gentry, Fugate, Wu, & Castellano, 2014; Wright, Ford, & Young, 2017). Researchers have consistently demonstrated that Asian and White students are proportionally well represented in gifted education while Black, Latinx, and Native Americans are underrepresented (Ford, 2003; Ford et al., 2001; Kitano & DiJiosia, 2002; Hodges, Tay, Maeda & Gentry, 2018; Neumeister, Adams, Pierce, Cassady, & Dixson, 2007; Yoon & Gentry, 2009).

Researchers have advocated for the use of alternative identification methods to address the issue of underrepresentation in gifted education (Naglieri & Ford, 2005). Card and Giuliano (2016) have even called for the use of universal screening (i.e., all students participate in identification testing procedures) in order to ensure that students from underrepresented groups with potential are identified. Although the number of participants in gifted programs has gradually increased over time with changes in identification practices (Eckes, n.d.), Black, Latinx, and Native American students have not equitably received educational services, compared to their peers (Hopkins & Garrett, 2010; Yoon & Gentry, 2009).

Gifted and Talented Students in Texas

Texas' definition of gifted and talented students is very inclusive, providing a framework for school districts to identify and serve students from diverse backgrounds. According to the Texas Education Code §29.121, a gifted and talented student is defined as "a child or youth who performs at or shows the potential for performing at a remarkably high level of accomplishment when compared to others of the same age, experience, or environment and who (1) exhibits high performance capability in an intellectual, creative, or artistic area; (2) possesses an unusual capacity for leadership; or (3) excels in a specific academic field."

Texas consistently invests in gifted and talented education and maintains its budget for gifted and talented education slightly above the nationwide average (NCES, 2003; NCES, 2013a). As reported by the Texas Education Agency (TEA, 2014b), 7% of students in Texas participated in gifted and talented programming in 1993-1994, and this percentage increased to 7.6% in 2006. Yet, Texas is no exception when examining underrepresentation of gifted Black, Latinx, and Native American students within the state (Slocumb & Olenchak, 2006).

For a period of 5 years starting in 1999, Texas gifted programs were monitored directly by the state. Following the implementation of No Child Left Behind, Texas removed state oversight of gifted programs and allowed districts to self-monitor (Warne & Price, 2016). Data from TEA (2014a) displayed a similar demographic distribution in 2013-2014. With Texas' overall student population at 12.7%, Black students only accounted for 6.5% in the gifted and talented program, whereas 16.2% were in special education programs. Latinx students also had similar pattern of representation in gifted programs: 41% of students participated in the gifted and talented program and 62.7% in Title I programs designed to serve at-risk children, considering that Latinx students make up 51.8% of the Texas school population. Contrasting with these results, Asian and White students represented 8.9% and

40.8% in the gifted and talented program, and 2.0% and 19.9% in Title 1 programs, respectively, while the overall student population was 3.7% and 29.5%. It is not surprising that researchers found the Great Recession affecting the representation of different ethnic groups in K-12 education programs differently (Mishel, Bivens, Gould, & Shierholz, 2012).

Budget, Economy, and Provision of Gifted Services to Black, Latinx, and Native American Students

Another important factor relating to the representation of Black, Latinx, and Native American students in gifted programs is the lack of funding for gifted services (Hopkins & Garrett, 2010). The laws related to gifted education vary by state, which results in inconsistent services and financial support for gifted students (Baker & McIntire, 2003). Without consistent financial support from state and federal governments, the underrepresentation of Black, Latinx, and Native American in gifted education is likely to continue or worsen (Elhoweris, Mutua, Alsheikh, & Holloway, 2005). Card and Giuliano (2016) found that budgetary cuts to a school district in Florida during the Great Recession, coincided with a decrease in the rate of identification for gifted Black and Latinx students.

Furthermore, the quality of gifted services may also vary due to different budgetary allowances for different school districts (Freelon et al., 2012). Researchers have found that, due to variations in school districts' budgets, schools with larger populations of Black, Latinx, and Native American students often face issues of higher student-to-teacher ratio, insufficient numbers of teachers, and adequate college preparatory curricula (Fanelli, Bertrand, Rogers, Medina, & Freelon, 2010; Freelon et al., 2012; Knight, 2017). Although some of these issues may have existed prior to the Great Recession, the situation became more acute after the Great Recession.

Rural-urban migration is another effect of the Great Recession that influenced the field of gifted education. Unemployed individuals from rural areas are likely to move to

metropolitan areas in search of better employment (Stoll, 2013). Moving a family can be a stressful experience for a student. A student's home life becomes unstable when parents have to deal with unemployment. This leads to lower educational achievement, represented as test scores (Ananat, Gassman-Pines, Francis, & Gibson-Davis, 2011). Test scores were not the only educational area affected by the Great Recession. Students from groups historically underrepresented in gifted programs underwent the most rapid decline in graduation rates in 2008 (Mordechay, 2017; Murnane, 2013). The onset of an economic slump influences students' grades and enrollment rates. This, in turn, could widen the excellence gap between underrepresented groups and their peers (Plucker et al., 2010).

The Great Recession and Gifted Funding in Texas

The Great Recession stretched from the end of 2007 to the middle of 2009**.** Though the Great Recession resulted in an economic downturn in the United States as a whole, the state economy in Texas continued to expand (Comptroller of Public Accounts, 2010). In particular, Austin, the state's capital, was experiencing an era of unprecedented growth (Bureau of Economic Analysis, 2017). Despite these economic conditions, the state of Texas reduced its education budget (TEA, 2013). This led to local funding sources comprising a greater share of Texas' public education funding.

Furthermore, Texas utilizes a recapture scheme to supplement state spending on education (TEA, 2013). What this scheme entails is that school districts that the states designated as property wealthy have a portion of their income taken and then redistributed to poorer districts in the state. In practice, this has led to affluent suburbs having their income recaptured and then redistributed amongst poorer rural and urban districts (TEA, 2013). Coupled with the effect of the recapture system of shifting the more of the responsibility of educational funding to suburban districts, educational budget in suburban districts was significantly reduced (Hodges et al., 2018). Texas school districts had reduced budgetary

allocations to gifted education since the inception of No Child Left Behind (NCLB), though suburban districts continued to fund gifted programs at increased levels compared to urban and rural districts (Hodges, 2018). The reduction in education funding by the state, spurred by the Great Recession, would lead those districts that had maintained funding during NCLB to reduce their allocation of budgets to gifted education (Hodges et al., 2018).

Purpose

The purpose of this paper is to examine the effects of the Great Recession and Texas educational budget on the representation of gifted Black, Latinx, and Native American students in the state of Texas. The motivation for the paper was to address and answer the call to research made by Plucker, Makel, Matthews, Peters, and Rambo-Hernandez (2017), who advocated for increased policy research in the field of gifted education. In turn, the purpose of this paper is to analyze how fiscal policy in Texas influenced the representation of Black, Latinx, and Native American students. The allocation of resources following the Great Recession allows researchers to gauge the relationship between budgets and identification of Black, Latinx, and Native American students in gifted education. The work presented here is a case study that will illuminate the relationship between underrepresentation and fiscal policy. We hope this paper will allow policy makers to be better informed about the consequences of their decisions.

The study design uses the framework of a longitudinal descriptive study using annually collected administrative data. A mixed effect model was used to analyze the data in this study. The following research question guided this study: How has the 2008 Great Recession influenced the identification rate of Asian, Black, Latinx, Native American, and White students for gifted services in the state of Texas?

Method

Data Sources

In compliance with Texas law, the Texas Education Agency (TEA) operates a database warehouse on their website. This data warehouse contains disaggregated budgetary information by district and aggregated enrollment data across the state. The dataset was acquired from the TEA data warehouse and includes annually collected information on all school districts (public and charter) in Texas for the time period falling between and including the 1999-2000 and 2014-2015 academic years.

Variables

Dependent variables. The primary variable of interest is the percentage of students identified as gifted of a given racial/ethnic group, *identified*. For example, the percentage of Black students identified as gifted was calculated by dividing the number of Black students identified as gifted by the total number of Black students in a district. For each academic year, 5 percentages were calculated for each school district (one for each race/ethnicity).

Race and Ethnicity. Five dummy variables were coded and assigned to their corresponding percentages. For example, for the dummy variable *Asian*, the percentages associated with Asian students were coded as 1 and all other percentages were coded as 0. This was done for each racial/ethnic group (Asian, Black, Latinx, Native American, and White). The result was a 5x5 dummy variable matrix denoted as *ethnicity* in the regression equation. It should be noted that during analysis, the percentages associated with White students were treated as baseline. Thus, the beta coefficients reported in this analysis are the difference between a given racial/ethnic group and White students. For example, the beta coefficient for Black students describes the difference in representation between Black and White students.

Revenue. A *z*-score of the total revenue per capita in a given year for a school was calculated for each corresponding observation (years nested in district). As such, it is considered a time varying variable in the analysis. Texas contains school districts with

operating budgets in excess of a billion dollars (e.g., Houston ISD, Austin ISD, and Dallas ISD). In contrast, the state contains rural districts with operating budgets of less than a million dollars (Hodges, 2018). This difference in scale can lead to coefficients that are difficult to interpret (Faraway, 2014). Given this, this variable was standardized. Standardization rescales the variable to have a mean of 0 and standard deviation of 1. This variable is denoted as *revenue* in the analysis.

Further, it is possible that an increase or decrease in funding at the district level could influence identification trends. Thus, this variable was included as a random effect to control for annual district level shifts in funding.

Percentage of students identified as gifted. This variable describes the proportion of students identified as gifted in a school district and is considered a time varying variable in the analysis. To provide greater clarity for interpretation, this variable was centered on .05 as Texas only funds up to 5% of an identified population.

Though Texas heavily incentivizes identification of 5% of a district's population as gifted, it is possible that annual rates of identification could influence ethnic identification rates. Consequently, this variable was included as a random effect in addition to a fixed level effect.

Percentage of students identified as at-risk. This time-varying variable describes the proportion of students identified as at-risk in a school district. Though a school district in Texas might contain schools labeled as Title I and others that are not, the percentage of students identified as at-risk serves as a strong proxy for the overall socioeconomic status of a school district.

Texas defines at-risk students as those with risk factors associated with dropping out. These factors include: homelessness, being on parole/probation, pregnancy or parenthood, being held back in a grade, in the custody of protective services, consistent low academic

performance, or residence in a residential placement facility (e.g., juvenile detention, foster group home, or substance abuse facility). This variable was included as a fixed level effect and a random district-level effect. The inclusion of the variable as a random effect allowed for the model to control for the district level fluctuations in the number of students identified as at-risk in a district.

Time Variables. Two time variables were coded in the model to create a piecewise regression with a break point at the 2008-2009 academic school year. The first variable - the overall academic school years - was treated as a continuous variable in the analysis. It was coded such that the academic school year 1999-2000 was 0, the following year as 1, the following year as 2, etc., up to the 2008-2009 school year. All years after this were coded as 9. This variable is denoted as *year* in the analysis.

A second time variable was coded as a dummy variable. All years prior to and including the 2008-2009 academic school year were coded as zero, all other years were coded sequentially starting at 1. This variable is denoted as *recession* in the analysis. The coding scheme can be seen in Table 1.

Dependence. Observations are derived percentages at time point *t* nested under their associated school district. To correct for dependence amongst observations, a random effect denoting the school district (*district*) is necessary (Faraway, 2014). Further, multiple percentages were calculated from a school district at time *t*. Given this, a second random intercept term denoting multiple measures was also included in the model.

Weighting procedure. Since the dependent variable is a percentage, estimates are likely to be biased without the use of a weighting procedure (Carroll & Ruppert, 1988). Observations were weighted using a probability of selection within race/ethnicity. For example, the weight for the identification percentage for Black students in a given school district in year *t* is calculated by dividing the number of Black students in that school district

by the total number of Black students in Texas in year *t*. The purpose of using this weighting scheme is for the regression coefficient to be reflective of overall state trends in representation rather than the marginal average. In other words, using this weighting scheme means that Houston ISD (with its larger student population) has a greater influence on the estimate than a small rural school district. Without this weighting scheme, they would be treated equally in the analysis.

Analysis

Regression equation. A generalized univariate mixed effect model approach was chosen as suggested by Faraway (2014). The following model was used to test the dependent variables:

$$
\begin{aligned}
Y_{ijt} = \ & \alpha + X\beta_1(ethnicity_{it}) + \beta_2(gifted_{it}) + \beta_3(atrisk_{it}) + \beta_4(revenue_{it}) \\
& + \beta_5(year_t) + \beta_6(recession_t) + X\beta_7(ethnicity_{it})(year_t) \\
& + X\beta_8(ethnicity_{it})(recession_t) \\
& + \left[u_{000ij} + u_{00i} + u_{1i}(year_{it}) + u_{2i}(recession_{it}) + u_{3i}(revenue_{it}) \right. \\
& \left. + u_{4i}(gifted_{it}) + u_{5i}(atrisk_{it})\right] + e_{ijt}
\end{aligned}
$$

This equation states that \ the *i*th percentage in the *j*th school district at time *t* is equal to the associated ethnic group (i.e., Asian, Black, Latinx, Native American or White students) $X\beta_1(ethnicity_i)$, the total percentage of gifted students identified in the district during the same year, $\beta_2(gifted_{it})$, the total percentage of at-risk students identified in the district during the same year, $\beta_3(atrisk_{it})$, the revenue of the district during that year $\beta_4(revenue_{it})$, the year $\beta_5(year_t)$, whether that year is before or after the recession $\beta_6(recession_{it})$, and the interactions between ethnic group and the years after the recession. Finally, the regression estimates for *year, recession*, *revenue*, *gifted,* and *at-risk* are allowed to vary within districts.

A generalized version of R^2 called Ω^2 was used to estimate effect sizes (Xu, 2003).

This value is calculated by taking the proportion of residual variance of the full model to the residual variance of the null model and then subtracting that value from one. The advantage of this estimate is that Xu demonstrated that it does not misestimate the coefficient of determination in mixed models as traditional R^2 calculations tend to do (2003).

Model fit and assumptions. The Bayesian information criterion (BIC) was selected as the most appropriate model fit indicator (Faraway, 2014). The BIC was used to assess which model fit the dataset best and the model with the lowest BIC was selected as the best fitting model. Model fit was used to determine the relationship between the time variables and the dependent variable. Model fits were evaluated for different combinations of linear and quadratic fit for the variables *year* and *recession*. All model fitting and analyses used in this study were completed using *R 3.3.1* (R Core Team, 2017) and the *lme4* package (Bates, Maechler, Bolker, & Walker, 2014).

Results

Model Assumptions

An analysis of the residual plot suggested that homogeneity was maintained. Mixed effect models assume normality for fixed and random effects (Faraway, 2014). The QQ-plot modeling the fixed effects showed a roughly normal distribution with heavy tails. This is unsurprising considering that there is an arbitrary cap on identification funding which is likely to influence gifted services at the district level. Given the large number of underlying observations in the dataset, it is unlikely that heavy tails will bias derived estimates (Faraway, 2014). The QQ-plot modeling the random effect of percentage of students identified as gifted also showed issues with normality. Again, this is likely due to the funding cap in place in Texas which influences decisions made at the district level. As such, given the large number of observations, the issue assumption of normality can be said to be met (Faraway, 2014).

Model Fitting

An intraclass correlation (ICC) was calculated to assess the effect of school districts on the gifted percentages across the state of Texas for gifted services. An ICC of 0.675 suggested observations within a school district are highly correlated to each other and provides statistical justification for using a longitudinal mixed effect model as the appropriate statistical modeling choice (Faraway, 2014).

Further, the inclusion of random effects in either model was assessed by examining the BIC. For the model for gifted identification, the inclusion of random effects improved the BIC from – 54,491 to -117,854. Initially, an examination of the means plot was conducted to assess possible fits (see Figure 1.). Visually, the means plot appeared to be linear. This was further assessed formally using the BIC. The BIC for model fit for linear/quadratic terms suggested that linear terms were appropriate and that including quadratic terms for *year* and *post-recession* did not improve model fit. Finally, the coefficient of determination for the final model examining gifted identification was Ω^2 = .43 compared to Ω^2 = .17 for the unconditional model.

Model Analysis

Table 2 contains means and summary demographic information. The full model results can be seen in Table 3, which includes the results from the unconditional model that only includes time variables as well. Further, since the primary unit of analysis is expressed in percentage points, additional decimal places were utilized in the table and text. Finally, in Table 3, Wald *t* values are included along with the derived beta coefficients and standard errors. The Wald *t* is the ratio of the beta coefficient to the standard error. This value was included due to rounding (since the given beta coefficients, standard error, and *t* value can be used to extend decimal places if desired) and for readers who are uncomfortable with the lack of *p*-values. The Wald *t* is approximately a *z* score with sample sizes greater than 1000 (Faraway, 2014) and so can be used to derive *p*-values. In interpreting these values, large

Wald *t* values are indicative of greater stability of the associated regression coefficient.

Gifted identification. In the model examining the percentage of students identified as gifted, the annual change prior to the recession, *year*, was minimal (β = -0.00043, *SE* = 0.00016). This suggests that the overall rates of identification of White students compared to non-White students declined by .043 percentage points. The associated standard error for this coefficient provides a measure of confidence in this estimate. Following the recession, this annual decline increased nearly 4-fold (β = -0.00208, *SE* = 0.00024). The annual percentage point decline in the rate of identification of White students compared to non-White students decreased from .043 percentage points to .2080 percentage points. This provides evidence that, as a whole, the Great Recession is associated with an acceleration in the decline in the rate of identification of White students to non-White students for gifted services.

All racial/ethnic groups were identified as gifted at different rates when compared with White students (Asian [β = 0.02315, *SE* = 0.00109], Black [β = -0.09597, *SE* = 0.00108], Latinx [β = -0.08933, *SE* = 0.00106], and Native American [β = -0.07033, *SE* = 0.00083]). In the years prior, the rates of identification annually increased for Asian (β = 0.00049, *SE* = 0.00020), Latinx (β = 0.00023, *SE* = 0.00021), and Native American (β = 0.00061, *SE* = 0.00020) students in comparison to White students. The identification rate of Black students remained stable prior to the recession compared to other student groups (β = -0.00002, *SE* = 0.00020).

In the years following the recession, there were positive changes in identification rates for Asian (β = 0.00562, *SE* = 0.00027), Black, (β = 0.00160, *SE* = 0.00028), Latinx (β = 0.00450, *SE* = 0.00029), and Native American students (β = 0.00029, *SE* = 0.00027), which suggests that these groups were identified at higher rates in comparison to the rate of increase for White students after the recession. Of all groups, the rate of increase of identification of Asian students changed most substantially. The annual rate of increase in identification for

Asian students compared to White students increased by greater than a factor of 10 after the Great Recession. This reaffirms the visual evidence for a demographic shift in the gifted population in Texas following the Great Recession shown in Figure 1.

Discussion

Despite overall budgetary cuts in school districts, the rate of identification for non-White students did negatively change in the years following the Great Recession for the state of Texas compared to White students. Of all student groups, Asian students experienced the largest gain in identification rates. Further, school districts in the state maintained or improved levels of representation for Black, Latinx, and Native American students. However, the representation of Black, Latinx, and Native American students in gifted programs is still far from proportional. As shown in Yoon and Gentry (2009) and Kettler, Russell, and Puryear (2015), Black, Latinx, and Native American students are still underrepresented in the state of Texas in comparison to White students. In contrast, Asian students are represented at higher rates in gifted programs when compared with the representation of White students. These results are no surprise and align with the gifted education literature regarding representation of students from different racial/ethnic backgrounds (Yoon & Gentry, 2009).

In comparison to other ethnic groups, there were minimal differences in the representation of Black students in gifted programs before or after the recession. However, after the recession, there was a positive increase in the rate of identification. That said, a reader should be reminded that the baseline comparison was White students. As illustrated in Figure 1, there was a general decline in identification rates for White students. This result provides a more nuanced perspective to the issue of proportional representation during the Great Recession. Leachman and Mai (2014) noted that Texas had drastically cut its education budget during the Great Recession. Such an economic shock is certain to have ramifications. As suggested by the beta coefficients for Black students, the gap in representation between

Black and White students was not one of those repercussions. It would seem that a financial crisis does not exacerbate the inequality. This result aligns with Ford and King (2014) who found that Texas had one of the smallest gaps (8th smallest) in the representation of Black students of all states in the U.S.

However, there is a more pessimistic interpretation of our results. Examining the means plot (Figure 1) puts the regression coefficients into context. The gap of proportional identification is closing not because more Black students are being identified for gifted programs but because fewer White students are being identified. In essence, the excellence gap (Plucker et al., 2010) is being closed but not because students from underrepresented populations are doing better, but because White students are not being identified in the same rates they were before the recession. More work will need to be done to ensure that all gifted students are able to have their needs met.

In contrast to Black students, Latinx students have seen a steady increase in representation in gifted programs since the Great Recession. Esquierdo and Arreguín-Anderson (2012) noted that Latinx were underrepresented compared to White students. The results presented here provide evidence that, although Latinx students continue to be underrepresented, the budgetary cuts in Texas did not exacerbate the underrepresentation of Latinx in gifted programming in Texas school districts. On the contrary, Texas has been increasingly successful in identifying Latinx students for gifted services in spite of budgetary cuts. Not only is there a greater percentage of Latinx students being identified as gifted, but the rate of identification suggests that the gap in representation will continue to decline. This is not to say that the gap in representation observed by Yoon and Gentry (2009) and Esquierdo and Arruguin-Anderson (2012) has been completely closed, but our results do represent a positive change. A reader should be cautioned, though, in interpreting these results in too optimistic a manner. In practical terms, at a rate of change of 0.40%, it will take

roughly 17 years for the gap in representation between Latinx and White students to close if the rate of change is held constant.

For Native American students, who had the smallest gap in representation of the three underrepresented groups, the annual rate of change decreased after the Great Recession. This suggests that the gap in representation between White and Native American students is not widening but has slowed in its rate of closing. For Native American students, one important question is whether the slowdown in representation will continue into the foreseeable future. Gentry, Fugate, Wu, and Castellano (2014) commented that the lack of representation of Native American students could be alleviated by increased staff development to address cultural differences. The problem may be that the restricted budgets following the Great Recession made allocations towards staff development difficult to justify (Hodges et al., 2018).

An important consideration is how the result for the identification rates of Black and Latinx students after the Great Recession aligns with the findings of Card and Giuliano (2016), who examined how budgetary cuts reduced the number of Black and Latinx students identified as gifted in one school district. The authors stated that the budgetary cuts were largely in the realm of universal screening. This, in turn, had a disproportionate influence on the identification rates of Black and Latinx students. Conversely, the rate of identification for White students was not related to the budgetary cuts.

In contrast to the findings presented by Card and Giuliano (2016), our results indicate that the identification rates of Black and Latinx students were not adversely affected by the Great Recession. Our findings do align with those of Card and Giuliano (2016) in that some student groups are not as sensitive to economic changes as others. In this study, the identification rates for Asian and Latinx students flourished after the Great Recession. Card and Giuliano speculated that underrepresented groups, who required additional support such

as universal screening, were most susceptible to economic contractions. Our findings regarding Asian students align with this interpretation but the findings for Latinx students do not. Latinx students are consistently referred to as underrepresented students in gifted education (Esquierdo & Arreguín-Anderson, 2012).

An important consideration in aligning the finding regarding Black, Latinx, and Native American students with Card and Giuliano's is that the present study encompassed an entire state rather than a single district. Analyzing an entire state allows for a greater overall picture of the relationship between the recession and identification. That said, Card and Giuliano were able to examine district level policy and make a causal claim whereas this study can only provide a descriptive analysis.

This study demonstrates, through the differing results for Black, Latinx, and Native American students, that traditionally underrepresented groups are not a single group but one where race and geography must be considered. In other words, even though students from these groups are all underrepresented in gifted education, using the label of underrepresented student to describe all of them only causes nuance to be lost. In order to fully understand the causes of underrepresentation, nuance must be considered over large aggregate labels. For example, in the Card and Giuliano (2016) study, Black and Latinx students were adversely affected. In this study, Black students were adversely affected but Latinx were not. The conclusion is that the issues surrounding underrepresentation are nuanced. The findings from this study do not invalidate the findings of Card and Giuliano (2016) but instead provide a more nuanced picture of underrepresentation in gifted education.

Limitations

The first limitation of this study is the methodological framework employed. The dependent variable is censored on one tail due to the impossibility of negative identification. Since identification is clustered around 5%, this does not necessarily create a strong

limitation but there still exists zero-inflation. The method we employed to remedy this was weighting. This corrective measure is appropriate (Lukusa, Lee, & Li, 2014) but still does not fully address the limitation. Particularly, regression coefficients for Native American students should be approached with greater caution than those for other demographic groups. This is because the percentages derived from Native Americans were subject to greater levels of zero inflation.

A second limitation of this study is that it only encompasses a single state. Education budgets were reduced throughout the United States (Leachman & Mai, 2014) as a result of the Great Recession. The extent of the budgetary cuts to gifted education in states is unlikely to be uniform. Further, gifted education policies differ between states. As such, generalizing the results of this study directly to other states should be approached with caution. This study would be strengthened by the inclusion of other states in the analyses. That said, focusing on a single state allows for assessing a state's policy in an in-depth manner.

A third limitation is the time frame of the study. Though the study encompasses 15 years (of which 6 years are post-recession), the full effects of the recession will likely not manifest until further into the future. The rates of identification are still affecting students who were identified for gifted services before the Great Recession. In the next five years, the children in gifted programs will be those identified for services in the years after the Great Recession. This will allow researchers to have a clearer picture of how policy changes enacted due to budgetary cuts influence identification processes for gifted services and the quality of gifted programs.

Another limitation is the inability to make a causal claim. This study is descriptive in nature. Caution should be taken in interpreting the findings of this study as causal. Alternative explanations to demographic changes in Texas' identified gifted population are plausible that do not directly relate to school policy. Further, this study does not account for differences

between districts. Local gifted education policies can vary across the state. Additionally, the influence of gifted faculty on identification cannot be measured with the data used in this study.

Implications

The greatest implication of our findings is in the field of policy. It can be easy to implement change in policy when there is a perceived deficit along with a public outcry. This research provides evidence that, as far as representation in gifted programming is concerned, the rates of identification for Black, Latinx, and Native American students did not greatly change in the years following the Great Recession in Texas. This can be interpreted as meaning that the budgetary cuts made to alleviate the effect of the recession did not make things worse in terms of underrepresentation However, it is important to note that when the gap of representation is already so wide, it may not become much wider.

Our results suggest that if the rate of change in closing the gap is too slow for educators and legislatures, policy changes must be made now. For example, if educators are not satisfied that, at the current rate of 0.27% per year, it will take 30 years for the gap in representation to close between Latinx and White students, then policy changes must be enacted now to ensure proportional representation within gifted programs.

Finally, the identification rate of White students in the state declined following the recession. A possible explanation is found in the results of Hodges et al. (2018). Suburban districts disproportionately reduced their budgetary allocations to gifted education in comparison to other locales. Hence, it is probable that reduced budgets correlated to fewer students being identified. Since White students are represented at higher rates in suburban districts compared to Black, Latinx, and Native American students in Texas (Kettler et al., 2015), it is likely that disproportionate budgetary cuts in suburban districts, in turn, disproportionately affected the identification rates of White students.

Future Research

The clearest extension of this research is to replicate the methods using the data from other states. This extension will allow researchers to compare the effects of the Great Recession in other states to the effects in Texas. In particular, large and populous states with high proportion of Latinx students (e.g., Florida or California) would be ideal to replicate this study. This will provide a better understanding of the representation of Latinx students in gifted programs.

A second direct extension is to replicate this study with information about the students who began enrollment in K-12 schools after the 2008-2009 academic school year in Texas. It is likely that representation rates of the students in this study were influenced by years prior to the Great Recession due to serial correlation. In practical terms, this means that the rates of representation in the years after the Great Recession are likely influenced by those preceding it. For example, if a school district identified 5% of its Black population as gifted in 2007-2008, it is unlikely that the percentage dropped drastically in the following year. Studying how representation changed after the recession only eliminates a portion of the probable serial correlation in representation rates.

A further area of research is to explore the cause for the decline in representation of Native American students in gifted programs within the last 5 years. Though the overall rates of representation of Native American students have increased, the trend in representation is downward. Conversely, the trend in rates of representation suggest that Black and Latinx students are closing the gap in representation in gifted programs. The question that begs future research is why the gap in representation is widening again (after narrowing) for Native American students.

Conclusion

The purpose of this study was to assess the influence of the Great Recession on

identification of underrepresented students in gifted programming. This study provided evidence that the Great Recession did not negatively influence identification rates for Black and Latinx students but did so for Native American students. The best possible news is that, at current rates assuming a linear relationship, in 30 years the gap in representation will be closed between Latinx and White students. When put into this context, any optimism garnered from the results of this analysis should be tempered. There is good news, and Texas educators should be proud. However, there is still work to be done if the gap in representation in gifted programming in Texas is to be closed.

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